FILE COPY

OCT 4 1939

IN THE

Supreme Court of the United States

OCTOBER TERM—1939.

No. 9.

STANDARD BRANDS, INCORPORATED,
Petitioner,

vs.

NATIONAL GRAIN YEAST CORPORATION,
Respondent.

BRIEF FOR RESPONDENT

STEPHEN H. PHILBIN,
PAUL R. AMES,
Counsel for Respondent.

October, 1939.

INDEX

	PAGE
Opinions Below	1
Jurisdiction	2
Questions presented	2
Statement of the case	2
(1) Yeast "manufacture"	3
(2) The parties	4
Summary of Argument	5
I. Hayduck Patent 1,449,103 is invalid, for lack of patentable invention	7
A. The alleged invention is the neutralization of harmful acidity from inorganic salts	7
B. It was known that a yeast wort should be maintained slightly acid	9
C. It was known that it was advantageous to neutralize excessive acidity	10
(1) Pollak neutralized lactic acid, in one step of yeast manufacture, namely, grain souring	10
(2) Wilfert neutralized sulphuric acid, in a similar step of yeast manufacture	13
D. Inorganic salts were old yeast foods, and it was known that harmful acidity from such salts could be neutralized	15
E. Authorities on patentable invention	19
F. The decisions below	20

PAGE

II. The Hayduck Patent 1,449,105 is invalid, for lack of patentable invention and for indefiniteness 22

A. The 105 patent 23

The claims 31

B. The prior art invalidates the patent 33

C. The patent is invalid, because of indefiniteness 34

Claim 4 36

Claim 10 40

The use of a density gauge does not save the patent 44

D. Petitioner apparently could not use the patent without experiments 45

III. Hayduck Patent 1,449,106 is invalid for lack of patentable invention and for indefiniteness 46

A. The patent is invalid, for lack of invention. 47

B. The patent is invalid, because of indefiniteness 51

C. Double patenting and too broad scope are not issues here 52

IV. Commercial success would be immaterial and it was not shown 52

Paper patents can anticipate 55

The issue of the patents by the Patent Office is entitled to little weight 56

Conclusion 58

TABLE OF CASES CITED

	PAGE
Altoona Theatres v. *American Tri-Ergon*, 294 U. S. 477, 486	19
Columbia Motor Car v. *Duerr*, 184 Fed. (CCA 2) 893, 908	39
Consolidated El. Light Co. v. *McKeesport Light Co.* (Incandescent Lamp case), 159 U. S. 465, 474	34
Dashiell v. *Grosvenor*, 162 U. S. 425, 432	56
DeForest Radio Co. v. *General Electric*, 283 U. S. 664	22
De Mayo Coaling Co. v. *Michener Stowage Co.*, 231 Fed. (CCA 2) 736, 737	54
Federal Yeast Corp. v. *Fleischmann Yeast Co.*, 13 F. (2d) 570	2, 21, 52
Fleischmann Yeast Co. v. *Federal Yeast Corp.*, 8 F. (2d) 186	2, 21
General Electric v. *Wabash Co.*, 304, U. S. 364, 369, 371	31, 35
Holland Furniture Co. v. *Perkins Glue Co.*, 277 U. S. 245, 257	36
Hollister v. *Benedict Mfg. Co.*, 113 U. S. 59, 73	51
Honolulu Oil Corp. v. *Halliburton*, 306 U. S. 550, 562	20
In re Bronson, 74 F. (2d) 726, 764	57
In re Hahn, 55 F. (2d) 483, 484	57
In re Thomson, 1906, C. D. 566	57
Miller v. *Eagle Mfg. Co.*, 151 U. S. 186, 198	50
National Sweeper Co. v. *Bissell Carpet Sweeper Co.*, 249 Fed. (CCA 2) 196, 198, 199	54

PAGE

Paramount Publix v. *American Tri-Ergon*, 294 U. S. 464, 473, 471 ..... 20, 53
Pearce v. *Mulford*, 102 U. S. 112, 118 19
Pickering v. *McCullough*, 104 U. S. 310, 319 56

Smith v. *Hall*, 301 U. S. 216 55
Standard Brands v. *Federal Yeast Corp.*, 38 F. (2d) 329, 337, 338, 343, 344 ..... 2, 23, 32, 33, 34, 49, 52

Textile Machine Works v. *Louis Hirsch Textile Machines*, 302 U. S. 491, 498 53
Thompson v. *Boisselier*, 114 U. S. 1, 11 19

Underwood v. *Gerber*, 149 U. S. 224 49

Walker, Patents, Deller Ed., 1275 50

IN THE

Supreme Court of the United States

OCTOBER TERM—1939.

No. 9.

STANDARD BRANDS, INCORPORATED,
Petitioner,
vs.
NATIONAL GRAIN YEAST CORPORATION,
Respondent.

BRIEF FOR RESPONDENT

OPINIONS BELOW

The opinion below of the Circuit Court of Appeals for the Third Circuit, finding invalid the three Hayduck patents 1,449,103, 1,449,105 and 1,449,106 (hereinafter referred to as the 103, 105 and 106 patents), is reported in 101 F. (2d) 814 and is in this record (1 R. 668).

The opinion below of the district court for New Jersey, finding the 103 patent valid, and the other two patents invalid, is reported in 21 F. Supp. 46 and is in this record (1 R. 626).

The opinion of the district court for Maryland, finding valid the 103 patent, is reported, *Fleischmann Yeast Co.* v. *Federal Yeast Corp.*, 8 F. (2d) 186. The affirming opinion of the Circuit Court of Appeals for the Fourth Circuit is reported in 13 F. (2d) 570, *sub nom. Federal Yeast Corp.* v. *Fleischmann Yeast Co.*

The opinion of the district court for Maryland, finding valid the 105 and 106 patents, is reported, *Standard Brands** v. *Federal Yeast Corp.*, 38 F. (2d) 329.

JURISDICTION

This case is here on a writ of certiorari, granted 306 U. S. 627, to the Circuit Court of Appeals for the Third Circuit, under Section 240(a) of the Judicial Code, 28 U S. C. A. § 347.

QUESTIONS PRESENTED

The grant of the writ of certiorari was "limited to the question of the validity of Hayduck Patents Nos. 1,449,103; 1,449,105; and 1,449,106" (grant, 2 R. 225, 306 U. S. 627).

STATEMENT OF THE CASE

The patents relate to yeast and purport to cover certain methods used in yeast manufacture. The case, however, is not difficult technically and the controlling facts are undisputed.

---

*Petitioner succeeded to the business of the Fleischmann Company and, for convenience, "petitioner" will mean either concern.

(1) Yeast "manufacture".

As appears from the Agreed Statement of Facts (1 R. 34), yeast is a living, unicellular, organism which multiplies by a budding process, the buds being split off to form new yeast cells. It is "manufactured" by encouraging its growth and multiplication.

Yeast requires nutrients, which are supplied to it by a solution of foods in water, called a mash or wort.

The nutrients must supply the yeast with carbon and nitrogen material, and also certain mineral substances, particularly phosphorus and sulphur. All these materials are found in grains and in molasses. However, the requisite nitrogen, as well as mineral material, can also be supplied by an ammonium salt, such as ammonium phosphate or ammonium sulphate.

A salt is the combination of an alkaline (antacid) material with an acid material. In the case of the salt ammonium phosphate, ammonia, a nitrogenous compound, has been combined with phosphoric acid. The salt is decomposed by the action of the yeast upon it, the salt being resolved into ammonia materials and phosphoric acid materials, which are then consumed by the yeast as required. Similarly, with respect to ammonium sulphate.

The yeast nutrients, such as grain materials, molasses, salts, etc., usually are from a fraction of a per cent to about twenty per cent of the wort content, the remainder being water. The thickness, or concentration, of the solution depends upon the kinds of nutrients employed, the nature and amount of the seed yeast which is employed to commence the propagation, etc., etc.

The yeast best grows and propagates in a wort which is slightly acid. The degree of acidity will tend to change

during the propagation, because as the yeast consumes the nutrients, both acid and alkaline (antacid) materials will be set free, in varying amounts and at different times, depending upon the kinds, amounts and proportions of the nutrients, the growth and propagation of the yeast, etc., and the yeast will consume them, partially or wholly, depending upon the amount of yeast cells present and their development. Thus the acidity of the wort varies as the yeast grows and multiplies.

The three patents in question purport to describe certain inventions in the manufacture of yeast. Generally, the 103 patent proposes to neutralize deleterious acidity in a wort containing inorganic ammonium salts, by adding an antacid material; the 105 patent suggests adding the nutrients during the growth of the yeast "at a rate such that the yeast may propagate and substantially all of the alcohol which may be formed is assimilated by the yeast" (claim 4 of 105 patent); and the 106 patent combines the neutralization idea of the 103 patent with the "rate of feed" idea of the 105 patent.

(2) The parties.

Petitioner has long been the largest manufacturer of yeast in the United States and is the owner of numerous patents relating to yeast processes upon which it has sued its competitors. The three patents here in question were among the ten patents in the patent suit filed by petitioner in 1924 against Liberty Yeast Corporation, purchased by petitioner before that suit was tried (1 R. 250, 593), and among the seven patents in the patent suits filed by petitioner in 1924 and 1925 against Federal Yeast Corpora-

tion (resp.'s ex. D-11). The present suit was brought on nine yeast patents (bill of complaint, 1 R. 13), four being abandoned prior to trial.

Petitioner asserted in the verified bills of complaint in each of these suits that each of the patents, totalling thirteen, had been "profitably used" in petitioner's manufacture of yeast. As there was no evidence apportioning among the various patents credit for the undoubtedly very large sales by petitioner, there can be no serious or well-founded contention that such sales were due to one or more of the three patents in question.

Petitioner itself does not appear to have contributed anything to advances in the yeast industry. Apparently all the thirteen patents upon which it has been suing were purchased from outsiders, except perhaps the Corby *et al.* patent No. 1,673,735, as to which there is no evidence it has ever been used, petitioner's briefs in the district court below admitting that it "has not been used commercially by plaintiff" (main brief, p. 30), and that petitioner "does not itself commercially practice the Corby invention" (reply brief, pp. 27, 28).

Respondent is a comparatively small yeast manufacturer, which independently developed its own processes, using grains, ammonium lactate and di-ammonium phosphate, as yeast foods. None of these materials is used in petitioner's processes, or described in any of the patents in suit.

The equities of the case are strongly against petitioner.

SUMMARY OF ARGUMENT

The three patents should be declared invalid and the decision of the Circuit Court of Appeals for the Third Circuit affirmed, for the following reasons, viz.:

1. The Hayduck patent 1,449,103 is invalid, for want of invention.

The patent claims the idea of neutralizing a particular kind of acidity, namely, acidity from yeast nourishing (ammonium) inorganic salts. But the prior art knew that a yeast wort should be maintained slightly acid, that inorganic ammonium salts were useful as yeast nutrients, that such salts might produce undesirable acidity, and that such acidity could be neutralized by the addition of an antacid material. Such knowledge anticipated the patent.

2. The Hayduck patent 1,449,105 is invalid, for want of invention and for indefiniteness.

The patent claims the idea of supplying the yeast with nutrients (nature and proportions unstated) at a rate such that much yeast and little alcohol will be produced. But the prior art knew that alcohol might be produced from sugar in the wort, that dilution of the wort would reduce the concentration of sugar (and hence the amount of alcohol produced); and that the low concentration desired for yeast propagation could be obtained by continuously feeding the nutrients to the yeast. The patent is invalid for that reason.

Patent claims for such a rate of feeding that much yeast and little alcohol would be produced, or that the concentration of the dilute wort remains constant, are void, for indefiniteness.

3. The Hayduck patent 1,449,106 is invalid, because it is merely for the use together of the neutralization idea of the 103 patent and the rate of feeding idea of the 105 patent. There was no invention in proposing such combined use.

There is the same defect of indefiniteness, as to rate of feeding, which is found in the 105 patent.

I. HAYDUCK PATENT 1,449,103 IS INVALID, FOR LACK OF PATENTABLE INVENTION.

Hayduck patent 1,449,103 issued March 20, 1923 upon application filed October 30, 1920. Claims 1 to 4 and 7 to 15, both inclusive, were found invalid in the present case, by the Circuit Court of Appeals for the Third Circuit, while the same claims, except 9, 10 and 11, were found valid in the Fourth Circuit. There is no material difference between the claims, for present purposes, the gist of the patent being the idea of neutralizing, in yeast manufacture, harmful acidity from inorganic salts.

A. The alleged invention is the neutralization of harmful acidity from inorganic salts.

Salts are composed of alkaline (antacid) materials and acid materials, and may be decomposed into alkaline parts and acid parts. Sulphur and phosphorus are inorganic, and, therefore, the salts, ammonium sulphate and ammonium phosphate, are inorganic salts. These salts are also termed ammonium salts, mineral salts, and yeast nourishing salts. The ammonium provides nitrogenous sustenance for the yeast and the sulphuric or phosphoric materials provide sulphur or phosphorus.

The Hayduck 103 patent states (p. 1, ll. 16-22; 2 R. 1):

> "An object of this invention is to provide a procedure for the manufacture of yeast on *a large scale commercially,** there being added to the nutrient solution which contains sugar material and yeast nourishing inorganic salts a neutralizing agent for neutralizing the deleterious excess of acidity."

*Italics ours unless otherwise stated.

Two parts of this statement are important. First, that the invention is for "the manufacture of yeast on a large scale commercially", instead of broadly, for any manufacture. This limitation was added by amendment of the Hayduck application during prosecution in the Patent Office (amendment filed Jan. 6, 1923), after discussion by the Patent Office of neutralization disclosures in patents and publications, particularly in the Pollak Swiss patent and a Henneberg article (Patent Office history of the 103 patent, petitioner's ex., P-6). The Patent Office then issued the patent. It may be observed that the district court in Maryland sustained the patent on the ground that petitioner was the first to use the process on a large scale commercially, and not upon the ground that the process was first known by Hayduck (*infra*, p. 20).

The second point to notice is that the alleged invention is limited to neutralization, during propagation of the yeast, of acidity from "yeast nourishing inorganic salts", instead of being broadly for neutralization of acidity from any source. This limitation was in the application as filed, undoubtedly because it was common practice in the yeast industry to neutralize acidity arising from other causes, the Hayduck patent itself stating (p. 2, l. 61, *et seq.*):

> "It is also known that an addition of basic or antacid substances to some fermenting liquids stimulates the fermentation, the injurious action of the acids on the life of the yeast being inhibited."

This is a clear admission that the yeast industry knew that it was desirable to neutralize excessive deleterious acidity whenever it might injure the yeast.

Claim 1 of the Hayduck patent is typical, being cited as such in petitioner's brief (p. 4). It is as follows:

"1. The process of manufacturing yeast which comprises preparing a yeast nutrient solution and propagating yeast therein with aeration, said yeast nutrient solution containing essentially sugar material and *yeast nourishing inorganic salts* from which components are liberated which tend increasingly to acidify the nutrient solution during propagation, and during the period of propagation *neutralizing the deleterious excess of such acidity.*"

Aeration was common practice prior to Hayduck, as appears from Jacquemin British patent 21,011 (p. 1, l. 30, 2 R. 127); Rainer German Patent 10135 (2 R. 135) and Kamienski German patent 269,192 (2 R. 142).

It is entirely clear that the only claim for patentable invention rests upon the very narrow idea that it might be advantageous to neutralize excessive acidity arising from a particular source, namely, inorganic salts. As will appear, Hayduck was not the first to know that inorganic salts might produce acidity which, if deleterious, might be advantageously neutralized.

B. It was known that a yeast wort should be maintained slightly acid.

The yeast industry knew, long prior to Hayduck, that the wort should be maintained slightly acid, in order to obtain the best results, Wilfert article, Presshefe, etc., 1890, (translation, 2 R. 172, two lines from bottom), "The yeast plant requires for its vigorous gro[illegible]h a liquid which is slightly acid"; Molhant, Brit. Pat. [illegible]617 of 1913 (p. 1, l. 29, 2 R. 133), the wort should be [illegible]nly slightly acid"; and American Distillers' Rev., 1914 (sec. col., 2 R. 161), "the distiller or yeast manufacturer should from time to time

make a special test to ascertain the most favorable degree of acidity for the raw materials he is using."

C. It was known that it was advantageous to neutralize excessive acidity.

It would seem obvious, if it were known that a solution should be maintained slightly acid, by testing during operation (this was known, as appears above), to add an antacid, if it were too acid. However, it is unnecessary to speculate whether the skilled yeast chemist knew enough to neutralize excessive acidity, because it plainly appears that neutralizing excessive acidity, by adding antacid materials, was old, in yeast manufacture.

(1) *Pollak neutralized lactic acid, in one step of yeast manufacture, namely, grain souring.*

When grains are employed as yeast nutrients, the grains are soured by the action of lactic acid bacteria in a souring tank, before being placed in the nearby propagation tank (Rautenstrauch, 1 R. 167). This is described in the Pollak Swiss patent 63,539 (transl., 2 R. 152) which corresponds to the Pollak United States patent, 1,123,920, one of the yeast patents upon which petitioner brought suit against the Liberty Yeast Corporation (1 R. 593) and to which petitioner was then attributing its so-called commercial success.

The Swiss Pollak patent commences as follows (2 R. 151):

> "In a plurality of processes of the fermenting industry a *natural acidification* is produced in the fermenting substrate, for example, in the mash in

order to increase the fitness of the liquid, for example, for the subsequent alcoholic fermentation by means of yeast. The acid formation, however, stops at a degree of acidity dependent upon the temperature and the kind of acid bacterium. If it be desired to push this formation of acid further and also to impart greater intensity to the physiological processes taking place at the same time, *the already existing acid concentration which interferes with the fermentation, must be reduced by neutralizing* by means of an alkali."

The "physiological processes" are the growth and action of the micro-organisms, which sour the grain, preliminary to the growth and action of the yeast micro-organisms. As described in the Pollak patent, "When the acid formation has reached a maximum" (so that the growth of the micro-organisms, and hence increase in acidity, is stopped), the amount of neutralization required for the mash is ascertained

"and to the latter [mash] is thereupon added so much ammonia that the amount thereof is sufficient for *neutralizing* ½-¾ of the amount of acid present. In this partly neutralized mash the acid-forming bacterium continues its work until the maximum of acid that can be attained thereby is attained once more. Thereafter the process of neutralization is repeated a number of times until even the increasing salt concentration causes the fermentation process to come to a stop. In this manner however, the formation of acid can be pushed to the quadruple of the former degree of acidity" (2 R. 153).

This is a complete disclosure of the desirability in yeast manufacture of neutralizing excessive acidity, by means of

adding antacid (alkaline, basic) materials, so that there will be "greater intensity to the physiological processes taking place". Referring to this Pollak process, the Hayduck patent admits (p. 2, l. 51, *et seq.*):

> "It is known that there can be added to mashes in lactic fermentation, nitrogen-supplying antacid substances, as for instance ammonia, ammonium carbonate or ammonium carbamate, for the partial *neutralization* of the lactic acid progressively formed and for the augmentation of the yeast-assimilable nitrogen content of the mashes so that they may be utilized for subsequent yeast propagation."

It is true that the above neutralization is not in the fermenting tank, where the yeast propagates, but instead is in the souring tank, in the immediately prior process of grain souring. But the principle is precisely the same. It seems absurd to contend that the workman who was operating souring tanks and fermenting tanks in continuous operation, watching carefully their respective acidities and neutralizing excessive acidity in the souring tanks, by adding ammonia, would not similarly neutralize deleterious acidity in the fermenting tanks, if it should occur.

Petitioner's brief (pp. 32, 33) discusses the Pollak patent and says (p. 33):

> "Pollak's object was practically the antithesis of Hayduck's. Pollak sought to make more sugar into an organic acid to form larger amounts of the organic ammonium salt, all *prior* to yeast propagation —Hayduck used the sugar plus inorganic ammonium salts to make yeast, and neutralized the deleterious excess of resulting acidity released *during* the propagation" (emphasis petitioner's).

Pollak grew souring bacteria, producing lactic acid to form the salt, ammonium lactate, and he removed excess free acid, by adding an antacid (ammonia) as required, because such excess was injurious to the souring bacteria. Hayduck proposes the same neutralization process, namely, to remove excess free acid, by adding an antacid (calcium carbonate, ammonium carbonate) as required, because such excess injured the yeast. It is true that the lactic acid neutralized by Pollak is not as strong as inorganic acids such as the sulphuric acid, neutralized by Hayduck, but this does not aid petitioner, as it would be even more natural to protect against excessive sulphuric acid than against excessive lactic acid.

The principle of neutralization of undesired acidity in yeast manufacture being thus disclosed in the Pollak patent, even if there were no other disclosure in the prior art, the Hayduck patent should be declared invalid. But there is additional prior art.

(2) *Wilfert neutralized sulphuric acid, in a similar step of yeast manufacture.*

The excerpt from the Wilfert article (Presshefe, etc., 2 R. 171) discloses that some sulphuric acid is beneficial to yeast development, but that excessive sulphuric acid is harmful, and that, if present in such amounts as to be deleterious, its harmful effect may be prevented, either by diluting the wort or by neutralizing it. In referring to a wort (mash) containing grains and sulphuric acid, Wilfert states (2 R. 172):

> "The sulphuric acid acts disadvantageously on the development of the yeast only when it is present in large amounts; conversely, a small amount of sul-

> phuric acid is highly beneficial for the development of the yeast, as it contributes considerably to the production of a very pure and vigorous yeast. The yeast plant requires for its vigorous growth a liquid which is slightly acid; * * *."

Wilfert proposes to reduce deleterious acidity, by using a greatly diluted mash, saying (2 R. 173):

> "In a mash in which the sulphuric acid content is diluted to that extent, the development of the yeast and the fermentation proceed in a perfectly normal way and there is no reason to be found for removing the sulphuric acid from the liquor."

However, if, after dilution, such removal should be desired, Wilfert says (2 R. 173):

> "This can be done in a very simple way by adding to the mash slaked lime—stirred up in water to give a milky fluid—until the acid taste of the mash is scarcely discernible any longer."

Lime (calcium compound) is an antacid, and the Hayduck 103 patent prefers to use a calcium compound as the neutralizing antacid (calcium carbonate, pat., p. 1, ll. 66, 87, 2 R. 1). Thus Wilfert cures an excess of sulphuric acid, which is harmful to the yeast in the fermentation process, by the "very simple" expedient of neutralizing precisely as Hayduck later proposed to do, dealing with the same acid (103 pat., p. 1, l. 85 *et seq.*).

With the materials and process described by Wilfert, the addition of neutralizing materials to the diluted original mash, was not necessary (2 R. 174):

> "As one can convince himself by a comparative test with two lots of the same mash, one of which

> was *neutralized* with lime whereas the other was left in the original state, the *neutralization* has not the slightest influence on the amount of newly-produced yeast nor its fermenting power, and for these reasons the neutralization can be omitted entirely."

Petitioner's brief (pp. 30, 31) refers to the Wilfert article and says (p. 31) that Wilfert

> "deals only with preparatory operations and not with yeast propagation and makes no disclosure whatever of the use of nitrogen from inorganic ammonium salts that would release deleterious acid, and likewise no disclosure of the use of aqua ammonia or other antacid to combat such deleterious acidity in yeast manufacture."

As Wilfert employed only malt and grain in his mash, and no inorganic ammonium salts, he naturally did not advise neutralization of sulphuric or other acid derived from such salts. But he did point out clearly that if there should be excessive sulphuric acid, it might be advantageously neutralized. It did not require inventive genius to neutralize sulphuric acid, whatever its source in any stage of yeast manufacture, by adding an antacid.

D. Inorganic salts were old yeast foods, and it was known that harmful acidity from such salts could be neutralized.

The Hayduck 103 patent does not claim that it was new to use ammonium salts, either organic or inorganic, as yeast foods, and the clear fact is that they have been long known as useful yeast foods. Ammonium phosphate and

ammonium sulphate are disclosed in the Mohlant British patent 11,617 (pat., p. 2, ll. 11, 12, 2 R. 134), ammonium sulphate in the Fritsche Austrian patent 45/4047 (2 R. 154), ammonium phosphate in the Jacquemin British patent 21,011 (pat., p. 3, l. 5, 2 R. 129), and ammonium lactate in the Pollak Swiss patent 63, 539 (2 R. 152).

Every salt, upon decomposition, may be resolved into its acid component and alkaline (antacid, basic) component, and inorganic ammonium salts are not exceptions. As they are consumed by the yeast, they inevitably must release acid materials or alkaline materials, which necessarily must affect the degree of acidity of the yeast wort solution and the yeast in the solution.

The yeast manufacturer, knowing that for the best results the yeast solution must be maintained slightly acid, tests its acidity "from time to time" (*supra*, p. 9). If it is too acid, for any reason, he must neutralize, and if too alkaline, he must add acid. Whatever may be the materials employed in the yeast wort, it must be maintained slightly acid. Dangerous acidity was guarded against by frequent testing, as above stated.

Sometimes, but not always, inorganic ammonium salts will produce deleterious acidity which should be neutralized. The amount and kind of salts, the nature of other materials, the dilution of the wort, etc. may produce an undesirable excess of acidity, but also they may not.

Petitioner's contentions with respect to the 103 patent (petitioner's brief, pp. 15, 17, 35, 39), are largely based on the false assumption that inorganic ammonium salts can not be commercially used without neutralization. For example, petitioner's brief states (p. 17, footnote), "Respond-

ent conceded at the trial that it had infringed patent—103, if valid (R. I, 627.)". But respondent used these salts in each of three different processes, and in only one, abandoned long prior to trial, were the salts so used as to require neutralization, respondent conceding at the opening of trial that this process infringed, if the patent was valid. Respondent's other two processes used extensively, were like prior art processes using such salts, and they were found by the district court not to contain any substantial neutralization (opinion, 1 R. 627, 628; decree, 1 R. 636, 637, 638).

There is a plain statement in the prior art that acids released from inorganic ammonium salts may be harmful to the yeast and that such acidity can be advantageously neutralized. Obviously, an excess of acids may harm the yeast, because it grows best in only a slightly acid solution, and also because the particular acids may be poisonous. As pointed out in an article by Henneberg (Journal, Society Chemical Ind., 1908, p. 415; 2 R. 159):

> "In the case of ammonium salts, these must undergo decomposition in order to take part in the formation of proteins, the acid of the ammonium salt being liberated; if, therefore, this acid has a poisonous action on yeast, the corresponding ammonium salt will have a similar action."

For example, if sulphuric acid is harmful, then the salt ammonium sulphate may be harmful, because the salt will liberate sulphuric acid.

Haydurk did not discover that the injurious effects of inorganic ammonium salts upon yeast could be neutralized,

because this was disclosed in the same Henneberg article (2 R. 158), viz.:

> "The inorganic ammonium salts have an approximately equal poisonous action on both kinds of yeast. Under ordinary conditions, these nitrogenous substances form excellent nutrient materials for yeasts, their injurious action only appearing in the absence of certain salts, which are more especially compounds capable of *neutralizing* acids." (See also Pure Products article, 1908, 2 R. 164, to same effect.)

The Pure Products article (1908, 2 R. 164) is a discussion of the Henneberg article, and states (2 R. 166):

> "Inorganic ammoniacal salts without lime salts or bases are, therefore, injurious" to yeast.

There can be no reasonable doubt that Henneberg disclosed the gist of the Hayduck patent, as was rightly declared by the Circuit Court of Appeals for the Third Circuit (1 R. 674 to 679).

Petitioner's brief (p. 28) says that "the opinion of the Circuit Court of Appeals below ignores entirely the fact that Henneberg a year later in 1909 wrote a text book (Henneberg's Prakticum), which, as distinguished from his reports on experiments, contained a section for the practical guidance of the commercial yeast manufacturing art" and did not mention the neutralization of inorganic ammonium salts. First, there is no evidence when he "wrote" the book, which was published in 1909. There is no presumption that text books are written in the year they are published, and often years are required. Second, the disclosure in the 1908 Henneberg article is not weakened by absence

from one or more subsequent Henneberg publications. If Henneberg once published the substance of the Hayduck patent, it can not be later patented by another.

Hayduck did not discover any new principle of neutralization, and the patent is invalid, because of the prior art which has been cited.

E. Authorities on patentable invention.

The Hayduck 103 patent is invalid, because the patent on its face is for a non-inventive step over the prior art, and also because the patent was anticipated by the Henneberg work.

Thompson v. *Boisselier,* 114 U. S. 1, 11:

> "So, it is not enough that a thing shall be new, in the sense that in the shape or form in which it is produced it shall not have been before known, and that it shall be useful, but it must, under the Constitution and the statute, amount to an invention or discovery."

Pearce v. *Mulford,* 102 U. S. 112, 118:

> "But all improvement is not invention, and entitled to protection as such. Thus to entitle it, it must be the product of some exercise of the inventive faculties, and it must involve something more than what is obvious to persons skilled in the art to which it relates."

Altoona Theatres v. *American Tri-Ergon,* 294 U. S. 477, 486:

> "An improvement to an apparatus or method, to be patentable, must be the result of invention, and not the mere exercise of the skill of the calling."

Paramount Publix v. *American Tri-Ergon*, 294 U. S. 464, 473:

> "To claim the merit of invention the patented process must itself possess novelty. The application of an old process to a new and closely analogous subject matter, plainly indicated by the prior art as an appropriate subject of the process, is not invention."

It is plain that the neutralization of the Hayduck 103 patent was clearly indicated by the prior art of Pollak, Wilfert and Henneberg. Hayduck did not discover any new principle. It was known in yeast manufacture prior to Hayduck that undesired acid should be neutralized, wherever it tended to injure the yeast, whether lactic acid (Pollak), sulphuric acid (Wilfert), or by acids released from inorganic salts (Henneberg). It was said, pertinently here, in *Honolulu Oil Corp.* v. *Halliburton*, 306 U. S. 550, 562, "No discussion, in addition to the convincing exposition by the circuit court of appeals for the fifth circuit, is required to show that the method claimed in suit was clearly indicated in the prior art."

F. The decisions below.

The district court for Maryland, which sustained the three patents, was influenced by the fact that the Fleischmann Company had sold large quantities of yeast under the patents, overlooking, it seems to us, that large sales by a powerful leader of an industry, does not necessarily mean that the product sold was made by a process which resulted from inventive genius. That court said that Fleischmann Company "is the leading yeast manufacturer in this coun-

try", referring to its "great size" and that "The testimony bearing upon the commercial practicability and success of the yeast process of the plaintiff is very strong", *Fleischmann Yeast Co.* v. *Federal Yeast Corp.*, 8 F. (2d) 186, 198.

The opinion of that court erroneously declared that a principle known in the laboratory could be patented by a late comer in the field, who used it for large scale commercial production, stating, in connection with the prior Henneberg work, 8 Fed. (2d) 186, 198:

> "It is one thing to show that, when yeast is used in fermentation processes, its fermentative power and duration of life will be enhanced by offsetting deleterious acidity or that in producing pure yeast cultures in the laboratory with distilled water, antacid substances should be used, and it is quite another to demonstrate that, when the end in view is the production of large quantities of yeast for its own sake, neutralizers may be advantageously employed."

Obviously, the use of an invention in a laboratory is one thing and the use of the same invention in successful commercial production is another. The latter may, and usually does, require executive ability, efficient organization, manufacturing technique, etc. But there is no sound justification for allowing a patent monopoly of an old invention, merely because of a first successful commercial use.

As the Circuit Court of Appeals for the Fourth Circuit affirmed on the opinion of the district court, 13 F. (2d) 570, the view in the Fourth Circuit was that the principle of neutralizing excessive acidity in yeast manufacture,

known to and described by earlier workers in the field, could be validly patented for commercial use by a later comer.

This erroneous view would probably have not been taken if this Court had previously rendered its decision in *DeForest Radio Co.* v. *General Electric*, 283 U. S. 664, where laboratory experiments by Lilienfeld and others invalidated the Langmuir "high vacuum" tube patent, despite the fact that Langmuir's company was the first to produce commercially such a tube. Although the Langmuir "high vacuum" tube was an improvement over the low vacuum tube of great importance" (*id.*, p. 678), the patent was found invalid, because it did not involve the inventive faculty.

In the present case, the district court for New Jersey, unduly respectful, we think, of the decision of the Circuit Court of Appeals for the Fourth Circuit, followed it (opinion, District Court, 1 R. 626), while the Circuit Court of Appeals for the Third Circuit correctly concluded that, as the Hayduck 103 patent failed to disclose any new principle, it should be declared invalid.

II. THE HAYDUCK PATENT 1,449,105 IS INVALID, FOR LACK OF PATENTABLE INVENTION AND FOR INDEFINITENESS.

The Hayduck 105 patent was applied for and was issued on the same dates, respectively, as the 103 and 106 patents, namely, October 30, 1920 and March 20, 1923. All the claims of the 105 patent were held invalid by both Courts below, on the ground of indefiniteness. The Circuit Court of Appeals strongly intimated, if it did not decide, that the claims were also invalid for want of patentable invention, saying (1 R. 683):

> "In our opinion the process described by Hayduck may constitute a mechanical improvement over the prior art but it is no more than this. But even if the process disclosed by Hayduck be held to constitute invention, the patent is invalid for indefiniteness as was held by the learned District Judge."

The district court for Maryland sustained claims 4, 8, 9 and 10, without deciding as to the other claims, against the defense of want of invention, *Standard Brands* v. *Federal Yeast Corp.*, 38 F. (2d) 329. The defense of indefiniteness was not raised before the Maryland court,* which, of course, did not pass upon it, and no appeal was prosecuted, because Standard Brands made a settlement with the defendant (1 R. 250, 593).

A. The 105 patent.

The object of the patent is to produce large quantities of yeast and a minimum of alcohol. In the fermentation process, some of the carbon compounds (sugar, etc.) will go into yeast cells and some will be converted into alcohol. The alcohol manufacturer controls the fermentation process so as to obtain much alcohol and little yeast, while the yeast manufacturer has the opposite object.

---

*There was not a word of testimony by the defendant that the patent was indefinite, that experiments were required, or concerning the 3° to 5° Balling sentence (Ex. D-11). In the present case, there is in the record ample evidence on these points, supporting respondent's position (Rautenstrauch, 1 R. 171, 198-200, 203-204, 238, 252; Free, 1 R. 535-537, 566-570; Rautenstrauch, 1 R. 574-580; Free, 1 R. 591). During the trial below petitioner's counsel conceded that Judge Soper did not have the 3° to 5° Balling matter before him (1 R. 420).

The 105 patent states (p. 1, l. 10; 2 R. 5):

> "This invention relates to a process for the manufacture of yeast and particularly to a process for manufacturing a compressed bakers' yeast in which very little alcohol is produced as a by-product, and has for its object an improved procedure for manufacturing yeast in a more convenient and economical manner than heretofore."
>
> "In the manufacture of yeast according to the usual aeration process, large quantities of alcohol are generated, the amount of which is to some extent dependent on the sugar available for the yeast."

Hayduck did not discover that the amount of sugar in the wort determined the amount of alcohol which would be produced. The industry knew that alcohol was produced from sugar; and, therefor that the wort should have a low concentration, if yeast instead of alcohol was wanted. The 1903 Iwanowski article in the Journal, Soc. Chem. Industry (2 R. 157) stated:

> "(2) the higher the concentration of sugar in the nutrient solution, the stronger is the alcoholic fermentation; (3) in solutions which contain about 0.5 per cent. of sugar and about double that quantity of peptone, hardly any alcoholic fermentation is to be observed."

An example of an old process, for maintaining a low concentration, in order to avoid alcohol production and obtain a high yeast yield, is given in the Hayduck 105 patent (p. 1, l. 33, *et seq.*), saying:

> "The process disclosed in the German patent to Rainier, 10135, endeavors to reach this goal [high yeast yield and low alcohol yield] by adding the

nutrient required for the yeast (sugar and peptone); in a manner which would produce this result, *i.e., by adding the peptones continuously and the sugar at intervals, as required,* and whenever analysis showed the need thereof, stating that *in keeping the concentration of the sugar very low* the formation of alcohol is prevented and the sugar is used only as a nutrient."

Hayduck's German patent 300,662, corresponding to the 105 patent (translation, 2 R. 187), also refers to Rainer (which the Hayduck 105 patent misspells). It is said that in Rainer

> "the nutrients necessary for the yeast (sugar, peptons) are added in portions or continuously according to need and so slowly that the yeast utilizes the sugar not for the formation of alcohol, but only for the nutrition".

And again (2 R. 189):

> "In the process according to the patent 10,135 in fact also the periodical or continuous addition of sugar or peptons to the liquid containing the yeast is provided, by utilization of the high dilution which is of advantage for the growth of the yeast at the expense of the formation of alcohol".

Simply, Rainer states that a high yield of yeast and little alcohol may be obtained, by maintaining the wort at a high dilution, feeding the nutrients periodically or continuously, as may be required.

The dilution of sugar in the wort is about ½ to 1%, as specified in the Rainer patent (2 R. 139), saying that "in each instance only ½-1% of dextrose or other carbohydrate

shall be added" to the wort (called "mass"). By thus adding sugar "in portions or continuously according to need", the desired high dilution would be maintained. Petitioner's expert agreed that the Rainer concentration was about 1° Balling* (Lamb, 1 R. 473).

The Balling scale is used for densities in a yeast wort (Rautenstrauch, 1 R. 203), and one Balling degree is about one per cent. concentration (Agreed Statement of Facts, 1 R. 35).

Hayduck, recognizing that the Rainer process would have "the advantage of the high yield in the yeast" (105 pat., p. 1, l. 54; German pat., 2 R. 188), thought that the high dilution of the Rainer wort (about 1° Balling) would increase the cost of operation, and so Hayduck proposed to use worts of from 3° to 5° Balling, and to supply them with nutrients in some way so that the yeast would consume the alcohol produced by this wort of higher sugar content. This is clear from his United States and German patents.

The 105 patent, after referring to Rainer "keeping the concentration of the sugar very low", etc., (p. 1, l. 41 *et seq.*), states (p. 1, l. 54 *et seq.*):

> "In the process described hereinafter and forming the subject of this invention, the goal of obtaining a high yeast yield with little or no formation of alcohol is reached *by the use of worts of normal*

---

*The Rainer concentrations are practical, because they are used in respondent's process, where "the actual density in the propagating vat during propagation was as shown in the exhibits and ranged from 1 degree Balling or slightly above at the start to a maximum of about 2.3 degrees Balling (on a yeast basis) at the end"; Agreed Statement of Facts, 1 R. 43.

> *quality and concentration,* the wort being added to the yeast continuously and at a rate such that no large excess of alcohol will be formed, and the yeast can assimilate most of the alcohol which is so formed."

By "worts of normal quality and concentration", Hayduck was referring to the worts commonly used in 1915 and which had concentrations of from 3° to 5° Balling (petitioner's expert Lamb, 1 R. 443). Hayduck proposed to obtain his normal wort by taking a part of a 12° Balling wort, diluting the part to 1° Balling and placing it in the fermenting vat, and then adding the 12° solution (pat. p. 1, l. 66, *et seq.*). The patent states that "The quantity of the diluted wort which is originally available for the yeast is so chosen, for example, that the mean content of the entire wort employed would be 3° to 5° Balling" (pat., p. 1, l. 90, *et seq.*). In this way Hayduck obtains the "normal" concentration of 3° to 5° Balling instead of the lower concentration of Rainer and others (including respondent).

The Hayduck German patent says (2 R. 188) this is "In contradistinction to the process of producing yeast from worts of very small concentration" and in referring to "the high dilution" of Rainer, says:

> "the operation with normally concentrated liquids has not been provided; the simple administration of the aforementioned process [Hayduck "normal" wort] is therefore missing which does not differ in any way from the normal process of the production of airation yeast in the production of the wort and in the expenditure of work".

The only difference between Rainer and Hayduck is that Rainer maintains a low dilution wort of about 1° Balling and Hayduck proposed to maintain a normal wort, of between 3° to 5° Balling.

The 105 patent says that with Rainer there is a "very low concentration of the sugar solution which is added from time to time to the fermenting wort" (p. 1, ll. 45 *et seq.*). But the Rainer patent does not state or imply that the added wort should have a "very low concentration," but merely that the sugar should be added continuously or periodically, as required to maintain the desired low concentration. There is no other limitation on the degree of concentration of the added sugar or peptone.

Petitioner's brief (p. 47) says that in the Maryland litigation "there was evidence that following Rainer's preferred process the yeast yield would be only 5% on the basis of the raw materials". It is true that petitioner offered such evidence in that litigation, but it failed to offer any in the present case (because, we think, petitioner realized this was not true). The only evidence in the present record is that of Dr. Rautenstrauch, who said the Rainer yield would be 125 to 150 per cent. yield on the sugar basis (1 R. 225), and Dr. Free, who operated the Rainer process (1 R., 287 to 303), finding that the yield on the basis of all raw materials used was in one case "41 per cent." and in another "53 per cent." (1 R., 295, 296). This testimony was given in respondent's case and thereafter petitioner put in its rebuttal case, with numerous witnesses and exhibits, including testimony by petitioner's expert concerning Dr. Free's tests (Lamb, 1 R., 421, 425, 428, 490, 491, 596 to 604, 607) and testimony regarding Rainer (Lamb, 1 R., 436, 437 to 441.

453, 513), but without a word in the record by any of petitioner's witnesses as to what would be the Rainer yield.

Petitioners' counsel now argue in their brief (pp. 47, 48) that the 53% yield obtained by Dr. Free was only 20%. There is nothing in the record to support this argument. They contend that Dr. Free caculated the yield on the basis of peptones and not the malt sprouts which produced the peptones, the latter being about one-third the weight of the former. But Dr. Free testified unequivocally that his yields were on the basis of "The raw materials including malt sprouts and all the rest of them" except water (Free, 1 R., 295), and records of his work, in evidence as respondent's Ex. D-4, show this (see pp. 4 and 5 for the 53% yield).

Petitioner's brief (p. 48) cites a 1912 book to the effect that the process of the 1879 Rainer patent "did not come to a successful realization". But this does not affect the broad disclosures of the patent. It may be that the specific materials and details of the Rainer process were not adapted to large scale commercial production, and that improvements were necessary. The same is true of many patents, including the Hayduck patents (none of which appears to have ever been used by anyone except in combination with many others). Also, in Rainer's time, there was no demand for the production of yeast without alcohol (*infra*, p. 53).

Petitioner's entire discussion of the Rainer patent (brief, pp. 44 to 50) misses the point. The question is not whether a prior patent discloses the precise method and materials, including specific proportions, of a later patent, but it is whether the later patent describes an inventive step over the first patent. Petitioner's expert on cross-examination stated the correct rule of interpretation, as follows:

> "XQ. 828. If you were reading that patent [Rainer], in order to obtain information from it, and you were endeavoring to practice that patent and use whatever data it had in it, would you necessarily follow the specific instructions of the patent?
>
> A. I think one should try to study the patent and see if there is a clear principle or idea there set forth and then should be guided by the central idea of the patent and the specific cases might serve as an illustration" (Lamb, 1 R., 514).

The Rainer disclosure that maintaining a very low concentration wort, by starting with a dilute solution and feeding nutrients as required, would produce much yeast and little alcohol, invalidates the Hayduck 105 patent.

It may be observed that continuous feeding of the nutrients, as the yeast grows and propagates, was also disclosed in the Delbrück article in Wochenschrift für Brauerei, 1903 (transl., 2 R. 174, 178):

> "The highest crop therefore is obtained by the continuous process of fermentation according to which there is first placed into a large fermentation vat the innoculating yeast together with a little wort, whereupon a *stream of fresh nutrient liquor is run in continuously*, distributed over, say 24 hours, until the receptable is full."

Clearly Hayduck did not "invent" the idea that the way to increase the production of yeast and to minimize the production of alcohol was to maintain a low concentration in the wort (Iwanowski), by feeding nutrients "as required" (Rainer process as stated in the Hayduck patent), or continuously (Delbrück). Indeed, this seems to be conceded in petitioner's brief (p. 19), which says that prior to Hayduck

"the art knew that high concentrations of sugar nutrient in the wort tended toward sacrificing yeast yield in favor of greater alcohol yield, but did nothing about it because other factors of cost and efficiency were practically involved;"

There was also the reason that prior to the last World War and to prohibition in this country "the desire was to create yeast and alcohol" (Rautenstrauch, 1 R. 234). But old knowledge can not be validly patented when it becomes economical to employ it, whether it is because of cheapness of materials, improvement in operations or a new demand.

The claims.

A patent monopoly is measured by the claims of the patent. "The claims 'measure the invention'," *General Electric* v. *Wabash*, 304 U. S. 364, 369, so the claims in issue must be examined. Petitioner asserts that the courts below erred in finding invalid all the ten claims of the patent, but, although petitioner has the burden on this appeal of establishing that the Circuit Court of Appeals below erred in holding that all the claims, with their different purported monopolies, were invalid, petitioner's brief fails to discuss any claim except clain. 10 (petitioner's brief, pp. 5, 41 *et seq.*). This should mean that petitioner has abandoned all claims except 10, by failure to present a *prima facie* case or argument. However, as it may mean that petitioner is seeking to reserve its contentions with respect to other claims to a reply brief, and thus prevent adequate answer, we shall select claims 1, 4 and 10 as typical and discuss them. They are as follows:

"1. A process of propagating yeast which comprises, initiating propagation of yeast in a dilute

nutrient solution containing all essential yeast nutrients, aerating the solution, and substantially continuously adding during the period of propagation, a solution containing all essential yeast nutrients."

"4. A process of propagating yeast with a relatively low yield of alcohol which comprises preparing a wort containing all essential yeast nutrients in solution, initiating propagation of yeast in a diluted portion of said wort, aerating the diluted portion, and substantially continuously adding during the period of propagation, a wort of higher concentration, at a rate such that the yeast may propagate and substantially all of the alcohol which may be formed is assimilated by the yeast."

"10. A process of propagating yeast with a relatively low yield of alcohol which comprises, preparing a wort containing all essential yeast nutrients in solution, initiating propagation of yeast in a highly diluted portion of said wort, aerating the diluted portion, and substantially continuously adding during the period of propagation, the wort of higher concentration at a rate such that the concentration of the dilute wort remains substantially constant, whereby substantially all of the alcohol which may be formed is assimilated."

The gist of claim 1 is a substantially continuous addition of all essential yeast nutrients during the period of propagation. This claim was in the Maryland litigation, but the district court, pointing out that it "omits any reference to the rate of feed", *Standard Brands* v. *Federal Yeast*, 38 F. (2d) 329, 338, declared that it was unnecessary to consider whether the claim could be saved by reference to the specification, as "other claims of the patent, limited as they are

by reference to the rate at which the concentrated wort is added, are valid," (p. 338). We think that it should be found invalid, because it is too broad on its face and it should not be construed to mean the same as other and narrower claims.

Claim 4 has the additional feature of the rate of addition. Claim 10 adds to claim 4 the statement that the rate of addition should be "such that the concentration of the dilute wort remains substantially constant". These two claims were sustained in the Maryland litigation, because of the rate of feed feature.

In the courts below, claim 4 was selected as typical, as appears from the opinions (district court opinion, 1 R. 630; C. C. A. opinion, 1 R. 681).

B. The prior art invalidates the patent.

No new principle is disclosed in the Hayduck patent. The idea of using a wort of *normal* concentration instead of a wort of *low* concentration, to obtain high yeast yields and low alcohol yields, did not rise to the dignity of a patentable invention. No new result was obtained, but merely what the old Rainer process obtained, as stated in the Hayduck patent, namely, "the advantage of the high yield in the yeast" (Hayduck, pat., p. 1, l. 52).

It was known that the production of alcohol could be controlled, by maintaining low concentration worts, Iwanowski and Rainer; that continuous feeding of nutrients might be desirable, Rainer and Delbrück; and that the feeding could be by "the addition of a concentrated to a highly diluted portion of the wort" (*Federal Yeast* opinion, 38 F. (2d) 337, referring to Kamienski German patent,

269, 192, 2 R. 142). It did not require inventive genius to use these principles with a wort of "normal" concentration.

The district court for Maryland pointed out that the Rainer patent and other prior art disclosed all the principles proposed by Hayduck, but decided that the combination of these old principles amounted to patentable invention, saying 38 F. (2d) 337:

> "The division of the wort into two parts, the beginning of propagation in one part, which had been diluted, and the addition of the other part continuously or at intervals, the restriction of alcohol production by regulating the supply of sugar—these several suggestions may be gathered together from the literature. But no publication shows the combination of elements found in claims 4 and 10 of the patent."

But that court was wrong and the Circuit Court of Appeals for the Third Circuit was right in declaring "In our opinion the process described by Hayduck may constitute a mechanical improvement over the prior art but it is no more than this" (1 R. 683).

C. The patent is invalid, because of indefiniteness.

The principles of law relating to the requirements of definiteness in patents are well settled.

Consolidated El. Light Co. v. *McKeesport Light Co.* (Incandescent Lamp case), 159 U. S. 465, 474:

> "If the description be so vague and uncertain that no one can tell, *except by independent experiments*, how to construct the patented device, the patent is void."

In *General Electric Co.* v. *Wabash Co.*, 304 U. S. 364, this Court said (p. 369):

> "* * * Patents, whether basic or for improvements, must comply accurately and precisely with the statutory requirements as to claims of invention or discovery. The limits of a patent must be known for the protection of the patentee, the encouragement of the inventive genius of others and the assurance that the subject of the patent will be dedicated ultimately to the public. The statute seeks to guard against unreasonable advantages to the patentee and disadvantages to others arising from uncertainty as to their rights. The inventor must 'inform the public during the life of the patent of the limits of the monopoly asserted, so that it may be known which features may be safely used or manufactured without a license and which may not'."

The claims of the Hayduck 105 patent are too indefinite. If infringement depended upon how successful a process was, the test would not be only whether a patented invention had been used, but the commercial ability of the manufacturer, his competition, labor conditions, etc. That is not the law. This Court declared in the *Wabash* case (p. 371):

> "A limited use of terms of effect or result, which accurately define the essential qualities of a product to one skilled in the art, may in some instances be permissible and even desirable; but a characteristic essential to novelty may not be distinguished from the old art solely by its tendency to remedy the problems in the art met by the patent."

Even if Hayduck had discovered some particular rate of feeding the nutrients, so that little alcohol would be pro-

duced, he would not be entitled to a patent for every rate which would perform the same function. This Court declared in *Holland Furniture Co.* v. *Perkins Glue Co.*, 277 U. S. 245, 257

> "A claim so broad, if allowed, would operate to enable the inventor who has discovered that a defined type of starch answers the required purpose to exclude others from all other types of starch and so foreclose efforts to discover other and better types. The patent monopoly would thus be extended beyond the discovery and would discourage rather than promote invention. *The Incandescent Lamp Patent, supra,* 476. That the patentee may not by claiming a patent on the result or function of a machine extend his patent to devices or mechanisms not described in the patent is well understood."

These principles may now be applied to the patent, and its alleged invention of feeding the yeast at a rate which is defined in the description as "a rate such that no large excess of alcohol will be formed, and the yeast can assimilate most of the alcohol which is so formed" (p. 1, l. 60 *et seq.*) and in typical claim 4 as "at a rate such that the yeast may propagate and substantially all of the alcohol which may be formed is assimilated by the yeast".

Claim 4.

What is the rate intended to be monopolized by claim 4? The remainder of the patent fails to teach what it should be and the reader is left entirely in the dark. The patent does not disclose whether, maize, corn, malt, rye, barley, potatoes, molasses, sugar beet, sugar, ammonium salts or other well known yeast foods (prior art patents, 2 R. 91 to

101) should be used, nor, of course, what should be the proportions of the nutrients in the wort. The patent says (p. 1, l. 99) "the yeast is constantly given new supplies of all nutrient constituents necessary for the propagation" and "there is always a wort concentration, by means of which the nutrients and the resultant substances are absorbed most efficaciously and quickly by the yeast". But what are these "nutrient constituents", and what is their rate of supply? The patent merely says that the *rate* should be whatever rate the operator may discover by experiments, which will result in a yeast yield, satisfactory to the operator, with a minimum of alcohol. As the district court below remarked, "it leaves the inquirer to experiment and by trial and error find out for himself what the rate may be" (1 R. 632), the Circuit Court of Appeals reaching the same conclusion (1 R. 683).

The yeast manufacturer did not need to be told by Hayduck that the concentration of nutrients in a wort was important, that some concentrations were better than others, that there was an optimum nor that the optimum, for his materials and process, could be ascertained by tests and experiments. The statement in the Hayduck patent that the nutrients should be supplied to the yeast at a rate such that a good yeast yield and little alcohol could be obtained was merely a statement of a problem, which the yeast manufacturer himself had to solve by experiments. Petitioner's expert admitted that yeast manufacturers prior to 1914 knew that the optimum concentration for large yeast yield and little alcohol could be obtained by experiments.

"XQ. 564. Does this patent say anything more about the rate of feed other than that it should be

a good rate of feed, namely, one that did not produce too much alcohol and one that gave the proper nourishment to the yeast?

A. I do not think that your statement is quite a fair one of the direction. The direction to furnish suitable quantities so that the yeast would have the optimum concentration of food for its growth is something more than just a general direction that you could characterize as good. Of course, to a yeast manufacturer it at once becomes evident that this optimum condition of the right concentration could be regulated and controlled simply by observations of the density of the liquid, the nutrient liquid during yeast propagation. This is a procedure which every yeast manufacturer is familiar with and which he would immediately adopt in order to secure this goal, this optimum condition, to which Hayduck calls attention. *It is my view that the yeast-makers of 1914 would know those things.*

XQ. 566. So that when Hayduck says you should feed the yeast with concentrated wort at such a rate that the yeast would grow well and there wouldn't be too much alcohol, your view is that the yeast-maker would know by testing and experiment what the different rates should be?

A. He could tell by his Balling readings what the proper rate was, and he could soon tell from his yields and from the production or non-production of serious amounts of alcohol as to whether he had really achieved this end that Hayduck had pointed out to him" (1 R. 457).

This "end" was not new with Hayduck, as it had been pointed out by Rainer and Iwanowski. Hayduck does not tell how this end is to be accomplished, and, as declared in

the Selden patent case, *Columbia Motor Car* v. *Duerr*, 184 Fed. (CCA 2) 893, 908:

> "A patent is granted for solving a problem, not for stating one. Its description must explain the invention itself, the manner of making it, and the mode of putting it in practice. In the absence of knowledge upon these points, the invention is not available to the public without further experiments and further exercise of inventive skill."

If experiments are necessary, the patent is void. In the present case, the evidence by both sides is entirely clear that tests and experiments would be necessary for the discovery of what should be the rate of feed, for any specific manufacture.

It is plain common sense that, as petitioner's witness Feild said on cross examination (1 R. 385), the rate of growth of the yeast

> "depends upon many variables. The more important ones are the amount of raw materials, the concentration of them, the kinds of raw materials, the preparation of the raw materials, the temperatures, the aeration and the rates of feed and many others. All those factors enter into the question of how quickly or how slowly you should feed the solution into the yeast."

With any particular set of factors, experiments are necessary to ascertain the best rate of feed.

> "* * * what I am asking you is how you determine, in your judgment, as a practical plant superintendent or production man, what that rate [of feeding] should be, whether it should be very quick or very

slow or whether it should change during the period or how?

A. You don't determine it at any one time but by a series of experiences" (Feild, 1 R. 384).

Respondent's witnesses Dr. Rautenstrauch (1 R. 574) and Dr. Free (1 R. 591), also acquainted with the practical manufacture of yeast, agreed with petitioner's witness that experiments are necessary to determine a rate of feed which, under the particular conditions, will give the desired results. As the patent gives no guide to the best rate of feed, saying merely that it is desirable to feed at a rate which will be beneficial to the yeast and will not produce alcohol, the patent merely states a known problem, not a solution, and the patent was correctly declared invalid for indefiniteness.

Claim 10.

Claim 10 is fatally indefinite, for the same reason as claim 4, namely, failure to teach how the known desirability of a dilute concentration during the fermentation process could be obtained.

Petitioner's brief (pp. 42, 43, 52) contends that claim 10 means that the rate of feed should be such that the wort concentration in the propagating vat is maintained at about 1° Balling, on the theory that the phrase in the claim, "the concentration of the dilute wort remains substantially constant" means a substantially constant dilution of 1° Balling. This contention is both erroneous and immaterial. First, the claim defines the wort as "dilute" and not as a wort of about 1° Balling dilution. Second, the specification of the patent is clear that the Balling of "the dilute wort" is

between 3° and 5°. And, third, it is immaterial with respect to the defense of indefiniteness whether the rate specified in the claim is a rate to produce much yeast and little alcohol, a rate to produce a "dilute" wort (which will result in much yeast and little alcohol) or a rate to produce a 1° Balling wort. In each case, the desirability of such a rate was known and the Hayduck patent does not teach how to obtain it, nor add to the previous knowledge that experiments were necessary.

Petitioner made a strenuous effort at the trial to establish its contention that Hayduck proposed to employ a low concentration of about 1° Balling (like Rainer and respondent), instead of "normal" concentrations of about 3° to 5° Balling, but was unsuccessful, the district court declaring "There was a sharp conflict" (opinion, 1 R. 643), without deciding it, and the Circuit Court of Appeals being silent on the point. It does not seem material here whether the "dilute wort" of claim 10 is 1° Balling or 3° to 5° Balling, for the reasons above stated. However, if it should be considered material, the evidence is that "the dilute wort" of claim is between 3° to 5° Balling, and is neither the 12° Balling wort or the 1° Balling wort mentioned in the patent.

The evidence on this point consists of what seems to us (and to respondent's witnesses) the plain language of the patent, and the opinions of the witnesses as to its meaning. The Hayduck 105 patent proposes to use a wort of "normal" concentration (Hayduck pat., p. 1, l. 58), correctly said by petitioner's expert to be from 3° to 5° Balling (Lamb, 1 R. 443), as contrasted with "the very low concentration" of Rainer (Hayduck 105 patent, p. 1, l. 44), which petitioner's expert said was about 1° Balling (Lamb, 1 R. 573). It was Hayduck's idea that the alcohol which

would necessarily be produced in his wort (because he had a "normal concentration"), would be assimilated by the yeast, as contrasted with the Rainer proposal to avoid production of alcohol, by using a very low concentration.

The process described in the Hayduck 105 patent (p. 1, l. 65 *et seq.*) is to place in the vat some "highly diluted" wort, about 1° Balling. Thereafter a 12° Balling wort ("the concentrated wort") is added, and "the mean content of the entire wort employed would be 3° to 5° Balling" (Hayduck pat. p. 1, l. 94). Claim 10 states that to the "highly diluted portion of said wort" is added "the wort of higher concentration", and "the concentration of the dilute wort remains constant". By "dilute wort" was meant the wort composed of both the "highly diluted portion" and the added "higher concentration" wort, the average being a "normal" wort of between 3° and 5° Balling.

Petitioner's expert witness had great difficulty in contending that the 3° to 5° Balling did not mean the concentration of the wort consumed by the yeast. (He was a chemistry professor, who had never had any practical experience in yeast manufacture or been associated with any yeast manufacturer other than the petitioner, for whom he testified in the Maryland suits, Lamb, 1 R. 52.) At one time he said that the 3° to 5° "language is really crystal clear once you see what it is all about, couldn't be stated more elegantly and exactly than it is stated" (Lamb, 1 R. 351) and at another time that "It is just an arithmetical relationship, stated, unfortunately, too briefly" (Lamb, 1 R. 362). However, he finally declared that, upon his interpretation, the sentence refers to "a purely hypothetical experiment" and "It is a wholly conditional—it is an

imaginary situation" (Lamb, 1 R. 369), not relating to the wort as used by the yeast in the fermenter.*

Petitioner also called two employees of the Federal Yeast Company (Feild, 1 R. 380; Kahn, 1 R. 618), but they did not testify as to the meaning of the patent as a whole, but merely as to whether their company used the formula which petitioner says is disclosed in the Hayduck patent. Petitioner had an injunction against their employer, restraining it from infringing certain patents (1 R. 383).

Respondent's witness, Dr. Rautenstrauch and Dr. Free, testified that they considered that when Hayduck said in his 105 patent "the mean content of the entire wort employed would be 3° to 5° Balling", he meant the wort used by the yeast and not a "purely hypothetical experiment".

Dr. Rautenstrauch was a Columbia professor of engineering, and also a consulting engineer, who has had extensive practical experience with yeast manufacture, was very familiar with yeast patents and other yeast literature (Rautenstrauch, 1 R. 243, 248, 249), and was exceptionally well qualified. He was vice president and general manager of the Liberty Yeast Corporation from 1923 to 1926 (which had several manufacturing plants and was a comparatively large manufacturer), when it was sold to the Fleischmann Company, for four million dollars (1 R. 164).

Dr. Free, another witness for respondent, was also well qualified to testify regarding the operations mentioned in the Hayduck 105 patent. He was a consulting chemist, a

---

*Petitioner's counsel during the trial denied that the 3 to 5 language "concerns the rate of feed during yeast manufacture", saying that it dealt "with the preselection in preparation to begin" (1 R. 410), and that "It has nothing to do with the feeding, with the rate of feeding. It has a great deal with (sic) do with the yeast manufacture" (1 R. 412).

member of the faculty of New York University, a chemist of the State of Arizona, and also a chemist and a scientist with the United States Department of Agriculture (1 R. 256), consultant for many years with California concerns and breweries manufacturing yeast and other fermentation products, namely, wine and beer (1 R. 270), and was competent to testify regarding yeast manufacture (Free, 1 R. 535). His judgment testifying as a chemist "would be exactly the same judgment if I were testifying as a practical yeast manufacturer" (1 R. 542). The reason for this was because he has studied the yeast manufacturing processes of other manufacturers of bakers' yeast in the United States, having had direct first hand contact with yeast manufacturing processes as carried out commercially by companies in this country (Free, 1 R. 557 to 559).

If the meaning of the 3° to 5° Balling sentence is doubtful, the opinion of respondent's witnesses is entitled to at least as much weight as those of petitioner. However, as above stated, claim 10 would not be saved by assuming that "the dilute wort" meant 1° Balling, because the art knew that the wort should be maintained at a dilution of about 1° Balling, by feeding nutrients as required.

The use of a density gauge does not save the patent.

Petitioner's brief (p. 52 *et seq.*) argues that the patent discloses a rate of feed such that the wort density will remain constant and that a saccharimeter, a density gauge, could be used to ascertain the density of the wort, and the feed of the nutrients thus regulated. The gauge, as stated in petitioner's brief, "is merely a float with graduations marked in degrees Balling, and the depth at which the

instrument floats in the wort can be read directly to indicate density of the wort".

But this does not aid the argument for definiteness. The gauge measures the total amount of solids in the wort, including seed yeast, propagated yeast, grain materials, molasses materials, salts, etc., and does not measure the amount of sugar in the wort, as pointed out by respondent's witnesses, without contradiction (Rautenstrauch, 1 R. 203, 204; Free, 1 R. 264, 581). Two worts might have the same percentage of sugar but very different Ballings, because of the other materials employed.

It is true that after experiments have been made to ascertain what rate of feed, with the particular materials used, amount of seed yeast, etc., will produce optimum results, such rate can be ensured for subsequent operations. But, the Rainer patent pointed out that the nutrients should be supplied "whenever analysis showed the need thereof" (Hayduck 105 pat., p. 1, l. 39) and required "a continuous observation of the conditions of the nutrients in the liquid" (Hayduck German patent, 2 R. 189), which is all that petitioner seems to be now claiming for Hayduck.

D. Petitioner apparently could not use the patent without experiments.

The petitioner in 1919 acquired rights to the alleged Hayduck inventions, and then commenced using the neutralization process of Hayduck patent 1,449,103 (Luce, 1 R. 102; 1 R. 593). Petitioner had the same right to use a continuous feed, instead of a batch operation, because of its ownership of the application for the 105 patent, which petitioner now says contains a very valuable disclosure of how to manufacture yeast. But it was not until 1923 that

petitioner used the process of the 105 patent (Luce, 1 R. 104; 1 R. 593). Petitioner failed to explain this four years delay, and it is unbelievable that, if this patent really disclosed a valuable contribution to yeast manufacture, petitioner, the largest yeast manufacturer in the United States, would not have immediately employed it, as it had every right and incentive to do. The conclusion is irresistible that the disclosure of the patent was inadequate, without extensive experiments.

III. HAYDUCK PATENT 1,449,106 IS INVALID FOR LACK OF PATENTABLE INVENTION AND FOR INDEFINITENESS.

Hayduck patent 1,449,106 was declared valid by the district court for Maryland, in the Federal Yeast litigation, as to the claims there in suit, namely, 1, 3, 4, 5, 6, 8, 12, 13 and 15, while the same claims were found invalid in the present case by both courts below, except claim 15, not in suit.

The alleged invention appears from the agreed statement of facts (1 R. 38):

> "8. Patent 1,449,106—The process of this patent is one combining the process of patent '103, including neutralization, and the process of patent '105, including regulated nutrient feed."

Although some of the claims in suit (1, 2, 3) do not specifically mention neutralization, the only process described in the patent employs that feature, and the parties agree that the patent is for the idea of using neutralization; the subject of the 103 patent, in combination with the proposal of the 103 patent to use a "rate of feed" suitable for production of much yeast and little alcohol.

The patent is merely for adding together the features of neutralization and rate of feed. There is no evidence that either neutralization or rate of feed operates differently when combined than when separately employed. Petitioner's brief (p. 7) says that the combination was "into a unitary process possessing more than the additive advantages of each". Petitioner does not say what such advantages might be, we do not know, petitioner does not cite the record for support of this assertion, and there is no support.

Claim 4 of the 106 patent is typical:

> "4. A process of propagating yeast with a relatively low yield of alcohol which comprises suspending seed yeast in a non-toxic aqueous liquid, aerating said liquid, substantially continuously adding thereto sugar material and yeast nourishing inorganic salts from which components are liberated which tend increasingly to acidify the solution during propagation, *which addition is at a rate such* that the concentration of the aerated liquid does not arise above that at which substantially all of the alcohol which may be formed is assimilated by the yeast, and during the period of propagation *neutralizing* the deleterious excess of such acidity."

Claim 13, referred to in petitioner's brief (pp. 5, 6), differs from claim 4 in the same manner that claim 10 of the 105 patent differs from claim 4 of the same patent.

A. The 106 patent is invalid, for lack of invention.

In the present case, the courts below considered whether it was a patentable invention to combine the 103 and the 105 procedures, and decided that it was not. The district

court for New Jersey said that as the 105 patent was invalid "its combination with a valid patent (103 patent) adds nothing to the art. This patent is therefore invalid" (1 R. 634), and the Circuit Court of Appeals for the Third Circuit declared "Since we have found patents Hayduck—103 and Hayduck—105 to be invalid it follows that we find this patent to be invalid since combining the processes of invalid process patents cannot result in validity" (1 R. 684). The decision was right that there was no patentable invention in proposing to supply a neutralized wort with nutrients at a rate such that substantially no alcohol will be produced.

As stated in connection with the 103 and 105 patents, the yeast industry knew that the wort should be maintained slightly acid (for yeast growth) and at a low concentration (to minimize alcohol production), that acidity could be controlled by neutralization, and that concentration could be controlled, by adding the nutrients in accordance with their consumption by the yeast, so that alcohol would not be produced.

It was well within the skill of the art and it did not require inventive genius, either to neutralize as required or to feed as required, and far less, these two matters being known, to use them together. A yeast manufacturer using continuous feeding would naturally neutralize his wort if it became too acid, and to do so would not require the genius of an inventor. Similarily, a manufacturer using such materials as required neutralization from time to time could readily employ the feature of continuous feeding without requiring an invention to do so. The 106 patent was correctly held invalid.

The district Court for Maryland did not decide the question of whether it constituted patentable invention to use together the features of neutralization and rate of feed.

The court took the position that Hayduck, because his application for the 106 patent was pending in the Patent Office at the same time as his applications for the 103 and 105 patents need not meet that question, saying, 38 F. (2d) 329, 343:

> "It has been held that, in the case of co-pending applications by the same inventor relating to the same art, it is not necessary to the validity of the claims of the latter application that they should embody a patentable advance over the earlier disclosure. The test is not whether the step between the earlier and later claims required invention".

This is not the law, nor is it sound. Why should an inventor who files an application based upon a real invention, and then files applications for minor improvements, be granted valid patents for such improvements? He has received his reward by the grant of a patent for his invention. Neither he nor anyone else should be permitted to monopolize non-inventive improvements, by other patents. If the improvement patents happened to issue later than the principal patent, as they ordinarily would, the result might be a prolongation of the monopoly of the first patent. The 103, 105 and 106 patents all issued on the same day, so that there is no such prolongation, but this does not affect the principle that only one patent can issue for an invention and that each patent must represent a patentable advance over all prior art, including that of the inventor.

In *Underwood* v. *Gerber*, 149 U. S. 224, the plaintiff had two patents, the applications for which were copending, and, as here, the patents issued upon the same day. The first numbered patent was for a particular composition of matter and the second numbered patent was for spread-

ing the composition upon paper. Suit was brought upon the second patent, which was held invalid, because there was no patentable invention in spreading upon the paper the composition of the first patent. If, as petitioner contends, a co-pending application can not be used to test invention, this Court could not have invalidated the second patent because of the first patent.

Miller v. *Eagle Mfg. Co.*, 151 U. S. 186, 198, states:

> "In *Underwood* v. *Gerber*, 149 U. S. 224, it was ruled that where a patentee obtained two patents on the same day, upon applications filed on the same day, they could not be treated as one patent with two claims, and that the complainant in suing upon the second, or the one having the latest number, could not use the first, or the one with the earlier number, to help sustain the action."

Even in a single patent, each claim should be considered "as setting forth a complete and independent invention", and "where a patent contains two claims which are alike, except that the narrower one of them calls for an unpatentable addition to what is called for by the other, the narrower claim is void" (*Walker, Patents*, Deller Ed., p. 1275), citing authorities.

Each invention must be examined on its own merits. A neutralized wort might be an invention and a particular method of supplying nutrients to a wort might be an invention, for which patents should be granted. But the idea of combining them is not necessarily a patentable invention. Assuming that it is not, and that one coming after Hayduck would not be allowed to patent this idea, why should Hayduck, who has precisely the same idea, be allowed a patent for it? In each case, the mental concept would be the same,

namely, to combine the two steps, and it would be clearly unsound to allow a patent monopoly in one case, although not allowable in the other, when the contribution of each to the public was identical. The existence of co-pending applications does not destroy the necessity for invention, and in such cases also, a patent is invalid if it "involves only the exercise of ordinary faculties of reasoning upon the materials supplied by a special knowledge, and the facility of manipulation which results from its habitual and intelligent practice" and "is in no sense the creative work of that inventive faculty which it is the purpose of the Constitution and the patent laws to encourage and reward", *Hollister* v. *Benedict Mfg. Co.*, 113 U. S. 59, 73.

There was no patentable invention in using the "rate of feed" proposed in the 105 patent with the neutralization proposed in the 103 patent, and, for that reason, the 106 patent is invalid.

B. The patent is invalid, because of indefiniteness.

The 106 patent is invalid for the same reason as the 105 patent, indefiniteness. The 106 patent states (p. 1, l. 70, *et seq.*):

> "The manipulative operation of the process is the same as described in German Patent 300,662 and in the aforesaid corresponding copending application for United States Patent Serial No. 420,832."

The German patent (2 R. 187) corresponds to the 105 patent, and the "copending application" resulted in the 105 patent; the "rate of feed" of that patent is an essential part of the 106 patent and because of the indefiniteness of such rate, the 106 patent, like the 105 patent, is invalid.

C. Double patenting and too broad scope are not issues here.

In the *Federal Yeast* case, the district court considered two defenses, neither of which was made here.

The defense of double patenting, clearly without merit, was overruled. There is double patenting when two patents have substantially the same claims. That is not the situation here, because the 103 patent claims neutralization, the 105 patent claims "rate of feed", while the 106 patent claims the combined use of neutralization and "rate of feed".

The defendant in the Maryland case also contended that the 106 patent was invalid, on the ground that it covered grain mashes, but this was summarily disposed of by the district court, which held that the patent did not cover grain mashes, 38 F. (2d) 344. No such contention has been made in the present case.

IV. COMMERCIAL SUCCESS WOULD BE IMMATERIAL AND IT WAS NOT SHOWN.

Petitioner's principal contention is that the three patents in suit should be sustained, because of "the practical commercial results accomplished by the patented processes" (brief, pp. 7, 8), "the industrial advance made by Hayduck" (*id.*, p. 10), "The Patented Inventions have Revolutionized the Art" (*id.*, p. 11), "petitioner had up to the time of trial made over one billion seven hundred million pounds of yeast" under the patents (*id.*, p. 17) and "the patented inventions revolutionized the industry" (*id.*, p. 58). But "* * * it is only when invention is in doubt that advance in the art may be thrown in the scale". *Paramount Publix*

Corp. v. *American Tri-Ergon Corp.*, 294 U. S. 464, 474, and the present case is clear for invalidity.

Also, petitioner has failed to establish that any commercial success was due to its use of the features of the three patents now before the Court. It is true that petitioner, long the greatest yeast manufacturer in this country, has sold very large quantities of yeast, but these large sales are accounted for at least in part by greater demand for baker's yeast, because of increase in the rate at which bread is being made in the bakeries as compared with home baking and increase in the population (Rautenstrauch, 1 R. 251). It may also be observed that prior to 1914, the fermentation process usually produced substantial quantities of both yeast and alcohol, and it was not until the advent of the last World War, which made it desirable in Germany to grow yeast for stock food and in this country to produce yeast instead of the Prohibition forbidden alcohol, that there was a demand for the production of only yeast (Rautenstrauch, 1 R., 234, 235).

It also appears that the features of at least thirteen patents were employed in petitioner's manufacture of yeast (*supra;* p. 5), and no endeavor was made to show the relative importances of these features.

As said in *Textile Machine Works* v. *Louis Hirsch Textile Machines*, 302 U. S. 491, 498:

> "Petitioner relies on the novelty of conception reinforced by an alleged commercial success. Commercial success may be decisive where invention is in doubt, but an insuperable obstacle to the invocation of that doctrine here is our inability, like that of the court below, to say 'that an art which knew how to reinforce "full-fashioned" webs without re-

entrant angles, and straight edged webs with such angles, required some uncommon talent merely to conceive of combining the two, for, as we have said, the patent can only stand on the bare conception.'"

* * * * * * * *

"Upon the record before us we cannot say that the commercial success is attributable to novelty of the bare conception of the use of the attachment with full-fashioned knitting machines rather than to the skill with which the patentee devised mechanisms for making the attachment effective, but for which he made no claim, or to the strength of the hands into which the patent came."

De Mayo Coaling Co. v. *Michener Stowage Co.*, 231 Fed. (CCA 2) 736, 737:

"The District Judge evidently was largely influenced by the circumstances that patentee's apparatus was generally accepted and has had a great commercial success. Such a circumstance is frequently persuasive evidence of patentable novelty. In this concrete case, however, the weight of such evidence is much reduced because the single claim in controversy does not cover the whole of patentee's device, but only a part of it, and it cannot be ascertained from the evidence that that particular part is what secured general acceptance."

National Sweeper Co. v. *Bissell Carpet Sweeper Co.*, 249 Fed. (CCA 2) 196, 198, 199:

"we may assume for argument's sake that each of these companies manufactured from the outset under each of the three patents, and that the credit of the invention is to be attributed equally to all; yet it is obviously quite impossible to say that the

> success was due to any one of the elements contributed by all. It is, indeed, impossible, upon this record, or upon all three records, for us to say that the success was due to all three together, assuming that would serve if we did. We do not question that success awaited any successful hand-driven vacuum cleaner; but we must be able to attribute the success to the invention * * *".

Petitioner failed to offer any evidence showing, or tending to show, that its large sales of yeast were due to the claims of the three patents now in question. Such failure, especially in view of petitioner's allegations in bills of complaint that it had profitably employed the process of thirteen patents, including the three, in its yeast manufacture, destroys the foundation for a contention that the patents should be sustained because of commercial success.

Paper patents can anticipate.

In connection with its claim of commercial success, petitioner refers to the prior art as "paper art" (brief, pp. 24, 28, 34), apparently contending that a disclosure of a process or principle in a prior patent or publication must be disregarded unless the evidence shows that there was successful commercial use of the process or principle. That is not the law. The public is entitled to rely upon such disclosures, without going to the trouble and expense of proving actual operation under them. The test of patentability is invention, not first commercial operation, and the patent statutes reward invention and not diligence in using known principles which, when first disclosed, may not have met with commercial success. In *Smith* v. *Hall*, 301 U. S. 216, 233, the Smith patent, for a method of incubating eggs, was

declared invalid, because "The Smith method was 'known or used by others in this country before his invention or discovery thereof'. 35 U. S. C. § 31". A prior use by one Hastings, although it had no commercial success, invalidated the patent, this Court stating (p. 232): "It is immaterial that his structure for using the method was neither the best possible nor as skillfully designed or used as that later employed by Smith".

In *Pickering* v. *McCullough*, 104 U. S. 310, 319, the objection to prior patents on the ground they were "paper" patents was overruled, because the objections to them "could be removed by mere mechanical skill, without the exercise of the faculty of invention". In *Dashiell* v. *Grosvenor*, 162 U. S. 425, 432, this Court referred to a prior art machine, saying "The very fact that a machine is patented, is some evidence of its operativeness, as well as of its utility,".

The issue of the patents by the Patent Office is entitled to little weight.

Petitioner argues that the patents should be sustained, because they were issued by the Patent Office, saying "patent -103 was allowed by the Examiners in the Patent Office in the face of the same prior knowledge now presented in defense to its validity" (brief, p. 34) and that "The Circuit Court of Appeals below found patents -103 and -105 invalid * * * * despite the fact that the same or substantially the same art had been before the Officials of the Patent Office, who had allowed the claims in suit thereover" (*id.*, p. 58).*

*The Patent Office did not have before it the articles of Wilfert, American Distillers' Review, Delbruck or Iwanowski, the two Henneberg abstracts, the Molhant, Fritsche or Jacquemin patents, or the evidence regarding their disclosures.

But the prosecution of a patent application is usually ex parte and the Patent Office issues patents when there is any reasonable doubt as to their possible validity.

> "In case of ordinary doubt, the policy of the patent system, as customarily maintained in the Patent Office, has been to give the applicant the benefit thereof, because no absolute right of property is conferred by the grant of a patent. (*Ex parte Fanshawe*, C. D. 1891, 203; 57 O. G. 1127). The patentee is merely put in a position to assert his prima facie right against infringers who may, in their defense, raise the question of the validity of the patent, and have the same finally adjudicated in the light of a full presentation and consideration of all the evidence attainable in respect of anticipation, prior knowledge, use, and the like." *In re Thomson*, 1906, C. D. 566, 571; 120 O. G. 2756.

To the same effect are the decisions by the Court of Customs and Patent Appeals, *In re Bronson*, 74 F. (2d) 726, 764, and *In re Hahn*, 55 F. (2d) 483, 484, the latter case holding that an applicant for a patent "is entitled, at least, to have any actual doubt resolved in favor of patentability".

In view of this policy of the Patent Office, the only presumption of validity attending the issue of a patent is that the Patent Office was not certain that it would be found invalid by the courts over the references considered by it. We believe that if the Patent Office had considered the additional prior art patents and publications discussed hereinbefore it would never have allowed the patents.

CONCLUSION.

The judgment of the Circuit Court of Appeals for the Third Circuit that the Hayduck patents, Nos. 1,449,103, 1,449,105 and 1,449,106 are invalid was correct and it should be affirmed.

Respectfully submitted,

STEPHEN H. PHILBIN
PAUL R. AMES
Counsel for Respondent.

October, 1939.

SUPREME COURT OF THE UNITED STATES.

No. 9.—October Term, 1939.

Standard Brands, Incorporated, Petitioner, *vs.* National Grain Yeast Corporation.	On Writ of Certiorari to the United States Circuit Court of Appeals for the Third Circuit.

[November 6, 1939.]

Mr. Justice McReynolds delivered the opinion of the Court.

The order which granted this Writ limits our consideration to the validity of Hayduck patents Nos. 1,449,103, 1,449,105, 1,449,106. They relate to processes for manufacturing baker's yeast and are owned by the petitioner. It will be convenient to designate them by the last three figures of their office numbers—103, 105, 106.

All three patents were declared invalid by the Circuit Court of Appeals below, 101 F. (2d) 814. In the District Court for New Jersey, 103 had been adjudged valid; 105 and 106 invalid, 21 Fed. Supp. 46.

The District Court for Maryland in two causes, (Soper. J.), held the patents valid, *Fleischman Yeast Co.* v. *Federal Yeast Corporation,* 8 F. (2d) 186, *Standard Brands, Inc.* v. *Federal Yeast Corporation,* 38 F. (2d) 329. The Circuit Court of Appeals, Fourth Circuit, affirmed the judgment sustaining 103, *Federal Yeast Corporation* v. *Fleischmann Co.,* 13 F. (2d) 570. The parties arrived at a settlement and no appeal was taken from the second judgment.

Much has been written relative to these patents in the carefully prepared opinions referred to above. They adequately reveal the facts and points of law incident to the prolonged disputation. Irreconcilable views have been approved and we must now decide which is to be preferred.

"Yeast is a small cellular micro-organism. In its ordinary significance, it is a conglomerate mass of infinitesimally small cells. It multiplies by self propagation, limited by the means of subsistence, and the quality and yield are greatly affected by the conditions under which propagation is carried on. Yeast has been man-

ufactured for at least 50 years by inoculating a wort; that is, by preparing a clear liquid solution and stocking it with a small amount of seed yeast. Such worts include substances to nourish the yeast cells, and are called yeast nutrient solutions. . . . The field for investigation and improvement has been the composition of the nutrient solution, and the character of the process employed during the period of growth."

Nutrient solutions often contain inorganic salts which are broken down through the growth of the seed yeast. Commonly, this brings about marked acidity. Growth progresses best in a slightly acid wort; over-acidity retards or destroys it; aeration of the wort accelerates growth.

The amount of alcohol, consequent upon the growth of yeast cells has direct relation to the concentration of the wort. When intensified the yield of alcohol increases; when lowered there is less.

Generally: Patent 103 proposes to neutralize any deleterious acidity in a wort which contains inorganic salt by adding an antacid material; patent 105 requires the addition of nutrients during the growth of the yeast "at a rate such that the yeast may propagate and substantially all of the alcohol which may be formed is assimilated by the yeast"; patent 106 combines the neutralization idea of 103 with the rate of feed proposed by 105.

Claim No. 1 of patent 103, typical of all, follows—

"The process of manufacturing yeast which comprises preparing a yeast nutrient solution and propagating yeast therein with aeration, said yeast nutrient solution containing essentially sugar material and yeast nourishing inorganic salts from which components are liberated which tend increasingly to acidify the nutrient solution during propagation, and during the period of propagation neutralizing the deleterious excess of such acidity."

In respect of this petitioners' counsel maintain—

"It covers, rather, the integral coordination of propagating yeast with aeration in a prepared solution containing essentially sugar material and yeast nourishing inorganic salts from which results an increasing acidification tending to become deleterious, and neutralizing the *deleterious excess* of such acidity in the solution while the yeast propagation is being conducted."

The Circuit Court of Appeals below declared—

"We think that it cannot be denied that the use of antacid or basic materials as neutralizers for acidity in respect to yeast is old in the art. . . . We think that Hayduck has simply set forth

a technique which is useful in the manufacture of yeast under modern methods. Hayduck's disclosures do not attain to the dignity of invention. His process is the result of the exercise of the skill of the calling, the application of an old principle to a similar or analogous subject with no change in the manner of application and without any substantially different result."

And it accordingly held patent 103 invalid for want of invention over the prior art.

Considering all the circumstances and notwithstanding the very forceful arguments to the contrary, we think this must be accepted as the better view.

Claim No. 10, typical of patent 105, follows—

"A process of propagating yeast with a relatively low yield of alcohol which comprises, preparing a wort containing all essential yeast nutrients in solution, initiating propagation of yeast in a highly diluted portion of said wort, aerating the diluted portion, and substantially continuously adding during the period of propagation, the wort of higher concentration at a rate such that the concentration of the dilute wort remains substantially constant, whereby substantially all of the alcohol which may be formed is assimilated."

Of this patent counsel for petitioner say—

It "is directed particularly to this procedural or manipulative, rather than chemical, aspect of the operation; i.e., a division of the wort into two parts with propagation begun in a diluted fraction and the gradual feeding in of the concentrated reserve as stated. By adopting this perfected process, the yield of yeast was still further increased and there were also other accompanying advantages in shortened time from commencement of the yeast propagation to the harvesting of the yeast crop and in enhanced quantity of output from a given sized apparatus."

The Circuit Court of Appeals below declared—

"It was well known to the prior art that if the creation of alcohol was not desired the nutrient solution should contain a low concentration of sugar. . . . In our opinion the process described by Hayduck may constitute a mechanical improvement over the prior art but it is no more than this. But even if the process disclosed by Hayduck be held to constitute invention, the patent is invalid for indefiniteness as was held by the learned District Judge. Both the times and manner in which the concentrated nutrient solution is to be added may be ascertained as we have stated solely by experimentation. The disclosure of the patent is therefore too vague and indefinite to constitute invention."

With this conclusion we agree.

As to patent 106 counsel have stipulated—

"The process of this patent is one combining the process of patent '103, including neutralization, and the process of patent '105, including regulated nutrient feed."

Since patent No. 103 is invalid for lack of invention and No. 105 invalid because the disclosure is too vague and indefinite, a claim for patent based upon the mere union of the two processes described therein cannot be sustained where as here, the proposed combination requires nothing beyond the skill of the art.

The challenged decree must be affirmed.

Mr. Justice BUTLER and Mr. Justice STONE took no part in the consideration and decision of this cause.

A true copy.

Test:

Clerk, Supreme Court, U. S.